

Application Serial No. 10/662,718
Reply to Office Action of September 21, 2006

PATENT
Docket: CU-3360

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REMARKS FEB 21 2007

In the Office Action, dated September 21, 2006, the Examiner states that Claims 1-3, 5 and 6 are pending and Claims 1-3, 5 and 6 are rejected. By the present Amendment, Applicant amends the claims.

In the Office Action, Claims 1-6 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Particularly, the rejection is directed to the phrase "heating while controlling the temperature of the substance so the temperature of the substance does not rise", in Claim 1. The Applicant respectfully disagrees with this rejection.

The specification discloses the following description: "As mentioned above, it is not preferable for the stage temperature to be raised. In that case, it is preferable to provide a temperature adjusting mechanism, which mainly cools, so as the stage temperature will not be raised. As a temperature adjusting mechanism, a chiller, a Peltier or a combination thereof, in which cooling water or cooling oil is circulated within grooves provided on the stage, can be used." The Applicant considers that such description allows one skilled in the art to fully understand the present invention.

In the Office Action, Claims 1-3 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kawase (US 6,730,357) in view of Gordon et al. (US 4,811,038), Nano et al. (US 5,921,836), and Pham et al. (US 2002/0127344). Claim 5 is rejected in further view of Noguchi et al. (US 5,606,356). Claim 6 is rejected in further view of Mian et al. (US 6,319,469).

Independent Claim 1 has been amended to incorporate the feature of dependent Claim 5. As such, no new matter has been added to the claims, and no RCE is deemed necessary to enter the amendment. The Applicant considers that at least this feature is not taught by the cited prior art.

In the present invention, since the heating device moves in X (longitudinal), Y (lateral), and Z (up and down) directions to the substrate, the heating device can effectively move to a region where the organic EL material is placed on the substrate immediately after its placement. Thus, it is possible to dry the organic EL material to form an organic EL layer that is very flat. Furthermore, even in the case when the

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organic EL material is coated in such a manner that the heating device reciprocates in parallel to the substrate, since the heating device reciprocates in parallel to the substrate, since the heating device moves in X (longitudinal), Y (lateral), and Z (up and down) directions relative to the substrate, the heating device can effectively move to a region where the organic EL material is placed on the substrate immediately after its placement so that the organic EL material can be heated and dried. Moreover, since the heating device moves relative to the substrate as mentioned above, it is possible to heat only the region which relates to drying the ink placed. Accordingly, a risk of heating a nozzle for applying the organic EL material to cause a change in the ink concentration, or to cause a poor ink discharge can be lowered.

Infrared heaters used for drying have an emission wavelength of 800 nm to 1500 nm. The organic EL material ink disclosed in Example 1 of the present application does not generally absorb the heat of the heater with the above-mentioned emission wavelength. Accordingly, such infrared heaters are not generally used when heating and drying the organic EL material ink. In the present invention, the above-mentioned infrared heater is not used to heat and dry the organic EL material ink directly. Rather, the infrared heater enables heating and drying of the organic EL material ink indirectly by allowing the heat from the heater to be absorbed in the substrate. Thereby, the flatness of the organic EL layer can be further improved.

On the other hand, Kawase discloses a method of manufacturing an organic EL display by using the ink jet method. However, Kawase does not disclose or suggest drying an organic EL material by heating with the infrared heater.

In Gordon, it is disclosed that the ink-jet nozzles and heater are combined to dry ink-jet ink. However, Gordon does not disclose or suggest the use of the infrared heater. Further, Nanto and Pham do not also disclose or suggest the use of the infrared heater.

In Noguchi, an infrared heater is disclosed for heating and drying general ink-jet ink. Nonetheless, Noguchi does not disclose or suggest using the infrared heater for the organic EL material ink as described in the present application.

Accordingly, the invention described in claim 1 has a unique feature different from any of the cited prior art while also providing advantageous effects original to

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the feature of the present invention. Therefore, the present invention cannot be achieved by merely combining the above-mentioned cited references, and it is not easily achieved by one of ordinary skill in the art.

In light of the foregoing response, all the outstanding objections and rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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Date


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